



Intecfatec: Innovative Entrepreneurship Focused on Surveying, Rescuing and Maintaining Actions Involving Companies and People Participating in Projects of This Nature

Adriano Carlos Moraes Rosa¹, Any Moraes Rosa², Vanessa Cristina Gatto³, Katia Cristina Cota Mantovani⁴, Sergio Augusto Siqueira⁵

¹Ph.D. in Production Engineering from Federal University of Itajubá - MG UNIFEI (2019), Professor of Higher Education, member in the INTECFATEC - Laboratory of Innovation and Entrepreneurship at the Faculty of Technology of Guaratinguetá-SP at the Paula Souza Center, Brazil. Research areas: creativity, open innovation, and entrepreneurship.

²Postgraduate in Strategic Management of Innovation and Entrepreneurship - Faculty of Technology of Guaratinguetá-SP, Brazil.

³PhD in Mechanical Engineering at the Faculty of Engineering of Guaratinguetá SP - UNESP (2011), Professor of Higher Education at the Faculty of Technology of Guaratinguetá-SP, Brazil - FATEC, at the Paula Souza Center, Brazil. Research in the areas of innovation, and entrepreneurship.

⁴PhD in Mechanical Engineering at the Faculty of Engineering of Guaratinguetá SP - UNESP (2011), Professor of Higher Education at the Faculty of Technology of Guaratinguetá-SP, Brazil - FATEC, at the Paula Souza Center, Brazil. Research in the areas of mathematics, statistics, and education.

⁵Technologist in Data Processing from the University of Taubate (1997), Specialist in Information Technology Management and ERP (2017) and Specialist in Corporate Finance and Banking (2017).Professor of Higher Education at the Faculty of Technology of Guaratinguetá-SP, Brazil - FATEC, at the Paula Souza Center, Brazil. Research in the areas of innovation, and entrepreneurship.

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Abstract— Small businesses account for more than a quarter of Brazil's Gross Domestic Product, and together, the more than 10 million micro and small enterprises in the country account for 30% of this GDP, and by 2022, Brazil will have about 17.7 million small businesses. In partnership with universities, companies and public authorities, people present ideas that will guarantee them the first steps towards entrepreneurship and innovation, providing an experience that, given talent, effort and even "luck", will bring success to realize your dream business. The Paula Souza Center in its ETECs and FATECs, holds every six months several of these projects, initiatives or ideas, whose purpose is to encourage entrepreneurship and innovation for small businesses. Lots of projects are selected and remain within a support structure, however, some are not chosen for "training", others are neglected by the authors who give up undertaking and others persist until the end, but faced with other priorities, simply end. Thus, using exploratory, bibliographic, documentary and field research (survey) were adopted to understand, rescue, and encourage projects, establishing a "support" to the student, former student or member of the community who has, had, or wants to have a project of an entrepreneurial nature. The authors sought to study and partially map an ecosystem of innovation and entrepreneurship between FATECs and ETECs located in the Paraíba Valley, verifying incentive programs to generate feedback for those involved and interested.

I. INTRODUCTION

Small businesses account for more than a quarter of Brazil's Gross Domestic Product, and together, the more than 10 million micro and small enterprises in the country account for approximately 30% of that GDP for the Brazilian Micro and Small Business Support Service (SEBRAE, 2019) and by 2022, Brazil will have about 17.7 million small businesses, that is, more than one million new ventures per year, according to SEBRAE, estimates. This number is 43% higher than the current one, which is 12.4 million Individual Microentrepreneurs and micro and small opting companies of Simples Nacional, a system that reduces the tax burden and bureaucracy. However, several studies point out the difficulties of people when starting their activities as a company, practicing entrepreneurship, and exploring the market with the shield of innovation. Many projects in partnership with universities, companies and public authorities propose the study, analysis, training and give individuals or already micro/small regular companies the first steps directing them to entrepreneurship and innovation, providing an experience in which, given talent, effort and even "luck", are classified as the next steps for the success or failure of the interested party to carry out his business (Santos and Pinho, 2010).

The Paula Souza Center or CPS in São Paulo (Brazil), more precisely in the ETECs (technical schools - vocational technical courses) and FATECs (technology colleges - higher education courses), have several of these projects and initiatives whose purpose is to encourage entrepreneurship and innovation for small businesses, several of them, implemented very successfully, in several units, which aim to provide the necessary and/ or basic tooling for the entrepreneurial training of students, former students and, people in the community, facilitating and better developing their socio-economic environment (CPS, 2020). Many projects are selected, targeted, and remain for months within a solid support structure. However, some projects are not chosen for "training", others are neglected by the authors themselves who give up attending "school". Others persist until the end, but months later they are no longer a priority of their creators and simply end up.

Thus, the idea of this article was to study and partially map the ecosystem of innovation and entrepreneurship of FATEC Guaratinguetá, a technological higher education institution of the CPS and FATECs and ETECs located in the Paraíba Valley region, to verify some programs of the same center and, thus, to promote partnerships, list initiatives or research on the subject that occurred in the units and to generate feedback for those involved. At first and mainly, establish focus on projects that are already active or closed, starting from exploratory

bibliographic, documentary and survey, for the people/companies involved.

This project is justified because it proposes issues relevant and necessary to institutions where innovation is the subject of debate and actions. Several institutions already in contact and studied previously ensure the lack of a reintegration, rescue, or maintenance approach to "old" or "discontinued" projects focused on entrepreneurship and innovation, which creates a "gap" in the ecosystem of innovation and entrepreneurship. Recent searches on the *Web of Science* or WOS portal (2015-2020) still show that the theme "entrepreneurship and innovation" is still quite incipient and has gaps within this knowledge base and can be very much addressed by several aspects.

Thus, the proposal became possible due to the structural ease of support and access of the authors with INTECFATEC, Laboratory of Innovation and Entrepreneurship of FATEC Guaratinguetá (SP) and the other regional units of the CPS, where they are collaborators, present their works and research results. In these technology centers considered a reference in the state and in the country, locally there are facilitators, researchers and entrepreneurs interested in the subject focus of this article.

Finally, using an exploratory bibliographic and documentary research methodology, the objective was to elaborate a conceptual update and based on this, go to the field, understand the situation of projects related to innovation and entrepreneurship in FATEC Guaratinguetá and in its surroundings covered by the CPS, rescuing old or encouraging new projects, establishing a "support platform" to the student, former student, or member of the community that has, had or wants to have a project of an entrepreneurial nature.

II. THEORETICAL FRAMEWORK.

In this section are presented some of the important and recent concepts on the main themes of this article such as innovation, entrepreneurship, its fragment for innovative projects, cite the importance of partnerships between university, companies, community, and feedback for projects, INTECFATEC and innovation ecosystems.

2.1 Innovation

According to Aveni (2014), the economist Jean-Baptiste Say was the first exponent to deal with innovation, in the work *A treatise on political economy: or the production, distribution and consumption of wealth*, edited in 1803 (French) and, again in 1821 (English), even not using exactly this term, because at the time, was considered entrepreneur or innovator the merchant or

people who made products circulate, especially by exchanges. But in a current concept, Trott (2012) defines innovation as the management of all activities that cover a process of idea design, development and improvement of technologies, manufacturing and marketing of a new product or a manufacturing process or equipment, a fundamental factor for economic growth.

Thus, innovation can be better explained as an action of transformation of classical methods of processes, knowledge, or even culture in favor of consequences for the construction of the new or renewed method (Gale, 2014), since, in recent years, much attention is considered for these methods in industrial and business contexts.

The act of innovating also represents the need to create strategies, and with them, success, and development, since the success of this rapid and intense development of innovation and entrepreneurship ecosystems enables countries to more capable of solving economic problems, promoting job creation, and leveraging socioeconomic advancement (Kon, 2016). This path to development is based on the deliberate action of public and private agents involved in this context, particularly through the perception of the need to promote, motivate and divide support activities and other stimuli, as the CPS does direct its INOVA Agency, which also relies on the efforts of ETECs and FATECs.

2.2 Entrepreneurship.

According to Degen (2009), the word entrepreneurship derives from the English term *entrepreneur*, which also derives from the French Latin word *entreprendre*, which brings together the words between, derived from *Latin inter* or *reciprocity* and *preneur*, derived from the Latin *prehendere* or *buyer* and, in the combination of the two words, has an intermediate meaning, that is, one of the basic functions of "modern entrepreneurship".

Already to Hisrich, Peters and Shepherd (2014), it is a technique to generate something new, with value for the application of period and effort required, recognizing your risk in the organization resulting in financial support and personal recognition, so entrepreneurship happens when people make things happen, create business through the opportunities that arise providing value to society.

Thus, the entrepreneur or entrepreneur shipper can be the one who changes an existing economic order with the introduction of new products and services, by creating new forms of organization or by exploring new resources and materials (Dornelas, 2016).

2.3 Innovative Projects.

For Judgev and Müller (2005), the evolution of success in projects in the last 50 years is rewritten in the face of new conditions for this success. Critical factors, new scenarios, and, respectively, the vision of this success change constantly over time, from definitions limited to the implementation phase to definitions that reflect the evaluation of the entire life cycle of projects, products, or services. Concordant, Rabechini Jr and Carvalho (2009), add by stating that the intensification of "innovative" and "non-routine" activities in organizations has stimulated the search for the factors that influence the success of a project, however, the premise that a set of factors can be applicable to all types of projects has been strongly questioned, given the fundamental differences between them.

Thus, in the face of explicit changes, the literature points to a real need to investigate "innovative" projects, not only on which management variables contribute most to the success of these projects, but also, the establishment of "contingency" relationships between these variables and the types of projects, since previous research between the type and management variables that led to a significant success of the projects may have been responsible for the non-conclusive outcomes of some of these studies on the determinants of the success of a project (Rabechini Jr and Carvalho, 2009).

2.4 Importance of Partnership University, Companies and Community.

Seraphim (2015) reported in his work that in the last three decades there has been a growing global effort to formulate public policies, regulatory frameworks, initiatives and plans that seek to stimulate public-private partnerships to enhance economic and social development from the intensive use of knowledge, science, and technology. In fact, universities and colleges are part of this "task force", increasingly perceiving its mission as more comprehensive than the production and dissemination of knowledge. They start to play a more proactive role in innovation systems, seeking forms of relationship with the productive and service sectors, so, promoting technological development with companies, without compromising academic values.

Naturally, the interaction between educational institutions and companies occurs from formal or informal personal relationships, by formal agreements and the creation of structures suitable for interaction, and such initiatives may have their objectives defined according to the research to be contracted, or, when in the development prototypings, tests, cooperative research projects, training,

or joint research programs (Khorsheed and Al-Fawzan, 2015).

Corroborating the theme, Cherubini Neto (2006) states that, elaborating and motivating projects, universities and other educational institutions become potential contributors and with a fundamental role in R&D and, mainly, in Brazil, influence the entrepreneurship and innovation practiced in some companies (which, without them they would not do so) and, therefore, resources for R&D are gradually expanded for these, as well as increasing the participation of universities as major providers of knowledge and local and regional economic development.

For Lahorgue (2004), based on the recognition that development depends on the innovation capacity of a society, two other findings appear: a) the growth processes are rooted in the territory and are endowed with history, that is, the innovative environment will interact in the local environment of a culture and actors who are there and, b) the capacity for innovation is linked to actors such as government and institutions that provide scientific and technological knowledge such as universities and universities and Colleges.

Thus, as Rolim and Serra (2009) explain in their work, many institutions that provide technological and scientific knowledge (such as universities and colleges) have aroused interest and have begun to guide work aimed at entrepreneurship and innovation, thus receiving attention in Brazil, and are now considered as a "key element" in the development process between regions, supported by studies of the National Information System for Regional Development, the SNIDR.

2.5 Feed Back as A Learning Tool.

According to Flores (2009), one of the main components of formative *evaluation is feedback*, an action that can regulate a teaching-learning process, continuously providing information so that the teacher perceives how far, or near, he is from the desired objectives. Because it is continuous, feedback *allows adjustments* needed for the best quality of learning to be made early and not only when the student fails the tests or final assessments, that is, in the summative assessment.

And for Zeferino et al. (2007), if on *the one hand feedback is essential*, it also does not guarantee learning without adequate stimulation of the cognitive and metacognitive processes of teaching, which should be the center of the teaching-learning process, which means that teaching should be encouraged to develop self-assessment and self-regulation of their learning. Complementing, Flores (2009) still alerts those interested about the main objective of feedback, which is to provide tools to improve

the performance of teaching, identifying their weaknesses and helping him to create alternatives to overcome them and, to have quality, the feedback does not need to be long, but needs to be clear, objective, and transferred in the most appropriate way possible, awakening the reflection of the teaching, because only in this way, can change some behavior.

Finally, according Zeferino et al. (2007), it is important to point out that the lack of feedback distances the teaching from the primary objectives of his training, often leading him to a misinterpretation of his behavior, which can generate two extreme consequences, the development of a "false trust" or "insecurity" in decision making, or abandonment of the project, because there are many studies that show that the use of feedback can "yes" improve the performance of teaching in the execution of various tasks, projects and development of skills in general.

2.6 Innovation Ecosystem.

According to Kon's research (2016), competition and collaboration between individual firms in the search for a share in the market gained new interpretation with Moore's 1993 article, that understood companies not as units of a single industry, but as a part of a *business ecosystem* that involved a number of industries and, in this ecosystem, companies evolve together around innovation, producing competitively, but also cooperatively, with the aim of developing new products that satisfy the consumer in the market.

According to Audy (2017), the most recent concept of Innovation Ecosystems, as equivalent to Areas of *Innovation*, aiming to establish a parallel or metaphor with biology and natural ecosystems, that is, where life is created, adapted and evolves, with intense interaction, synergy and, regardless of the model of innovation environment adopted, whether in a region or in a city, the development of an area of innovation will require a series of factors to succeed in the process of economic, social and urban transformation involved.

In short, Rossi et al. (2014) explain that an *Innovation Ecosystem* models the economy, and its functionality is to enable technological development and innovation. In this context, the actors would be material resources (such as funds, equipment and facilities) and human capital (students, professors, support, researchers and industry representatives) that shape the institutions participating in the ecosystem and, these institutions, in competitive countries, are universities, research institutes, hybrid university-company arrangements, federal or industrial centers of excellence, schools and business es, venture capital companies, organizations supporting

economic development and state or local business, development agencies, policy formulators, among others.

2.7 Intecfatec

The Innovation and Entrepreneurship Laboratory of the Faculty of Technology of Guaratinguetá, called INTECFATEC, is an initiative responsible for local and regional programs to encourage the culture of innovation and entrepreneurship. Its objectives permeate local and regional economic and social development with training activities, complement of curricular activities and other activities that develop skills and skills of innovation and entrepreneurship, promoting the culture of innovation and entrepreneurship, promoting the dissemination of new technologies and their uses, expansion and dissemination of work opportunities and personal development.

Thus, INTECFATEC is an environment that stimulates the creation and development of projects and ideas for new businesses that, from an idea identified as a solution for the market. Whether as an individual microentrepreneur, micro and small business, the laboratory offers technical support and complementary training to the entrepreneur, whether he/she is a student, former student, or member of the community.

In addition to mentoring and consulting, INTECFATEC collaborates with the Innovation Ecosystem, local and regional entrepreneurship with initiatives such as *Hackathon*, *Startup Weekend*, School of Innovators, Training for the Canvas Business Model and Technical Visits. Its structure is composed of a manager and a technical team of teachers who, together with students and former collaborating students, realize innovation and entrepreneurship.

III. METHOD

Exploratory research, the basic method of the elaborated work, according to Gil (2019), is a format of scientific research and constitutes the production of studies that allow the researcher to familiarize with the object being investigated and, its application should generate greater proximity between the researcher and the universe of the object of study, offering information and guidance in the construction and formulation of the research

hypotheses. Through it, they identify new possibilities, formulate new ideas and build hypotheses.

Also as a method, a comparison of material already acquired and the addition of updated material was developed, that is, a comparison of accumulated knowledge that, as far as its nature is, is classified as *applied research* (Marconi and Lakatos, 2010), a method assisted by investigation of a problem related to the applicability of scientific knowledge and, which will still be based on a *bibliographical* research (Gil, 2019), material that, although partially developed recently, will still be complemented and added to other knowledge bases that will still be raised. Basilar as a methodology, we also adopted *documentary research*, a procedure for materials that have not yet undergone analysis or that can be re-elaborated according to the objectives of the research, which is supported by materials that have not yet received any in-depth analysis and aims to select, treat and interpret the information, seeking to extract some meaning from it and introduce some value with the main purpose of contributing to the scientific community (Martins, Mello and Turrioni, 2014).

Also, as support, we used the survey or *orsurvey*, whose characteristics are of great scope, especially when using a technological tool (whose purpose is also exploratory) to obtain data and information about actions, characteristics or opinions about a group representing the target population and, which greatly facilitates the access and collaboration of the units "focus" to be researched (Forza, 2002). Finally, as the research receives qualitative and quantitative treatment, uses a research instrument, and adopts field research (personal observation and interviews), it also receives the typology of mixed approach or mixed *methods research* (Creswell and Clark, 2007).

3.1 Questionnaire Applied.

The basis of the questionnaire applied electronically (by *SurveyMonkey* and *Googleforms* tools) is shown in Figure 1:

Survey Questionnaire

Dear participants, this questionnaire aims to collect information on **Entrepreneurship** and **Innovation** in your teaching unit, that is, a survey focused on motivation, rescue and maintenance of actions or initiatives that involve companies and people participating in projects of this nature directed at ETECs and CPS FATECs. Your answers will help us to compose a mapping of our current situation of internal and external projects. Thus, we anticipate our thanks for the reports.

- 1** What is your **Gender**? Male Female Other: _____ I prefer not to say.

- 2** His **Age** is: 17 to 20 years 21 to 25 years 26 to 30 years 31 to 40 years More than 40 years

- 3** You are: CPS **Current Student** or **Former Student** at ETEC FATEC: Unit: _____
 Community Member close to ETEC FATEC: Unit: _____

- 4** In the unit (ETEC / FATEC) that you attend, **are there any initiatives** related to entrepreneurship and / or innovation? Yes No

- 5** How many projects have you **proposed** (an idea of your own) or **known** (ideas from your fellow students)? Explain.

- 6** What were **the highlight areas** of these projects?

- 7** **Did you succeed in your project?** So, please define success and explain the reason for that success.

- 8** **Was not successful?** Then, explain why you haven't (yet) achieved this success.

- 9** **Didn't complete your project** or have you given up? For what reason?

Fig.1: Questionnaire Applied.

Source: Prepared by the Authors

IV. RESULTS AND DISCUSSION

4.1 Participants.

Between November 2019 and December 2020, the survey/questionnaire was submitted and multiplied, and from it 327 answers (provisional), 52 representatives of the community, 131 representatives of the ETECs (students and former students) and, of FATECs, 144 students and former students, as can be observed in Figure 2.

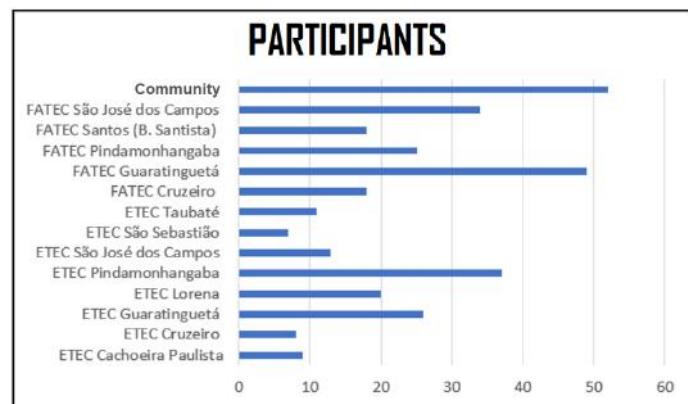


Fig.2: Total Participants/Respondents.

Source: Prepared by the Authors

4.2 Gender

Regarding gender, 188 respondents chose "Male", 112 answered "Female", 19 pointed out the alternative "Other" and, 8 of them "Preferred Not Answer - PNA", as shown in Figure 3.

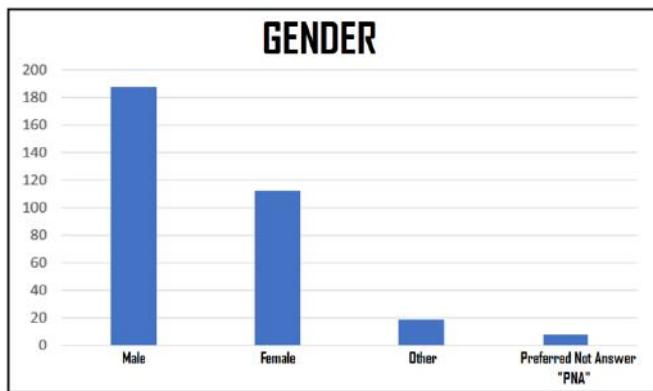


Fig.3: Gender of respondents.

Source: Prepared by the Authors

4.3 Age

As observed in Figure 4, most respondents are between 21 and 25 years old (101 years), followed by the age that intervals 26 and 30 years (86 of them). The minority is part of the interviewed population that is in the age group over 40 years (18 respondents).

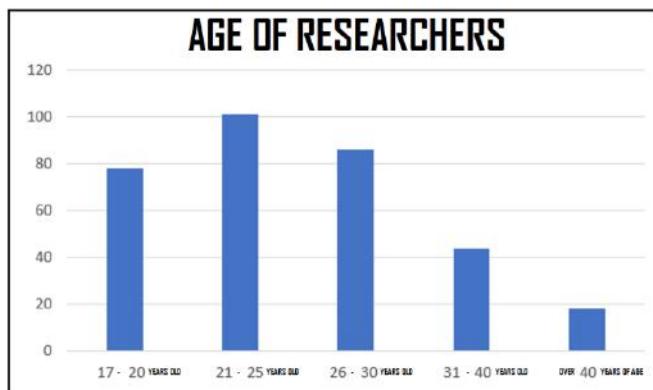


Fig.4: Age of Researchers.

Source: Prepared by the Authors

4.4 Origin

According to the answers obtained the origin of most of the questionnaires that returned are from current students of FATECs (121 responses) and ETECs (78 responses), however, there were many former students of FATECs, ETECs and community members who also helped answering emails and calls (Figure 5).

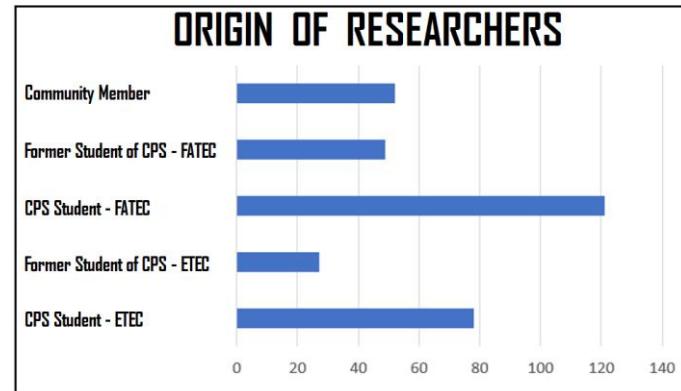


Fig.5: Origin of respondents.

Source: Prepared by the Authors

4.5 Agreement with Entrepreneurship and Innovation Initiatives.

As expected, all respondents agreed that in the CPS units that attend or attended, they had initiatives related to entrepreneurship and/or innovation, as can be seen in the representation (Figure 6).

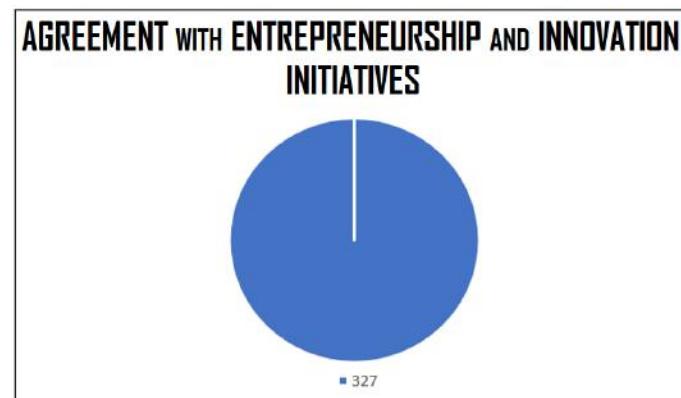


Fig.6: Agreement of Respondents on Initiatives.

Source: Prepared by the Authors

4.6 Proposals (own projects) and Knowledge (projects proposed by colleagues) of Projects.

The respondent was asked whether he proposed or knew any project in the unit and, as a precious information, the number of 948 proposed projects was known, divided into 428 project proposals and 520 projects known (projects proposed by colleagues) or researched (own projects) by respondents in the CPS units, as shown in Figure 7.

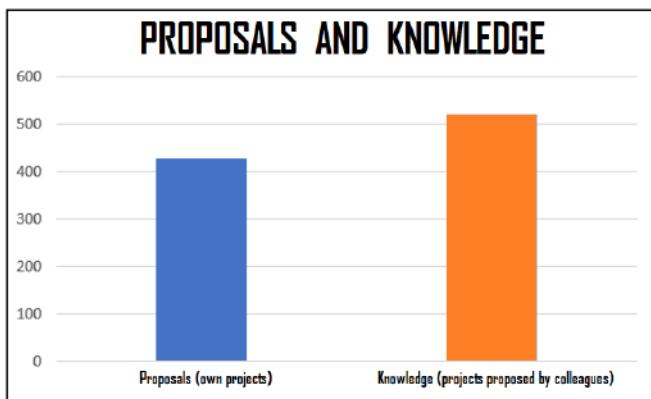


Fig.7: Proposals and Knowledge of Project Respondents.

Source: Prepared by the Authors

4.7 Featured Areas.

As shown in Figure 8, *Services*, *Applications*, *Food* and *Infoproducts* were the areas most highlighted by respondents, when sending /preparing a project or when they researched projects from other colleagues.

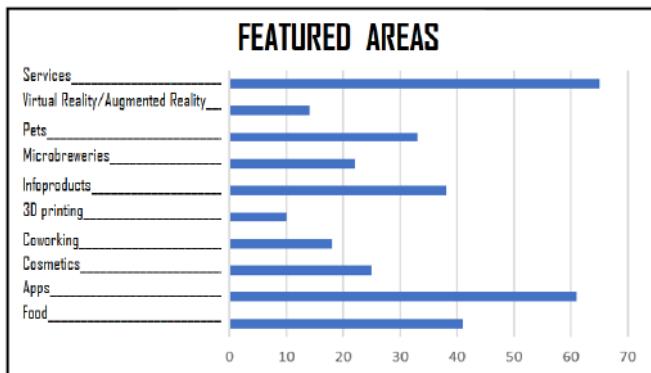


Fig.8: Project Featured Areas.

Source: Prepared by the Authors

4.8 Success in The Project, Definition of This Success in Words and Main Reasons.

When asked if they were successful in the project, 78 of them answered "yes" (Figure 9). Success that in words was defined mainly by *success*, *competence*, *triumph*, *victory*, *achievement*, *achievement*, *good feeling*, *glory*, *luck*, and *happiness*. Among the reasons for this success, were mainly mentioned: *study*, *help*, *support*, *attention*, *support*, *investment*.

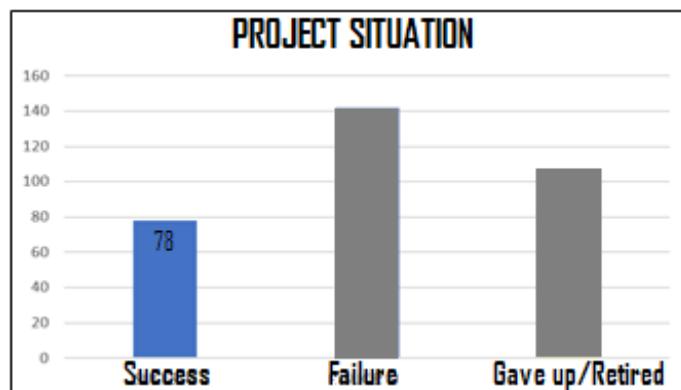


Fig.9: Project Situation - Success.

Source: Prepared by the Authors

4.9 Failure in The Project (Provisional) And Reasons.

Regarding the provisional failure (projects that are still in progress), 142 respondents understood that they belong to this classification (Figure 10). When asked about the reasons for this failure, the most cited were little *time*, *inexperience*, *health problems*, *personal problems*, *family problems*, *inadequate support*, *little investment*, and *disinterest*.

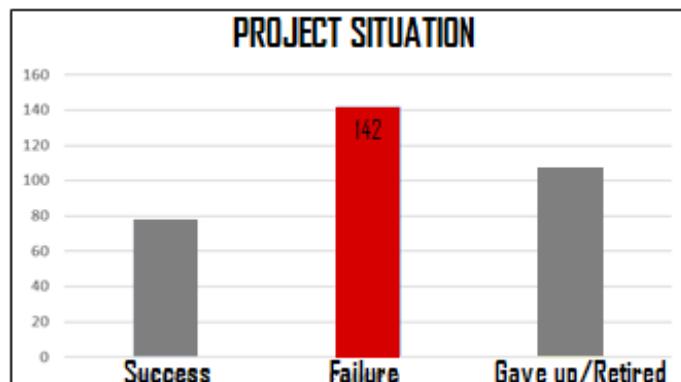


Fig.10: Project Situation - Failure.

Source: Prepared by the Authors

4.10 Definitive “Retired” of Projects

As can be seen in the representation (Figure 11), many respondents who collaborated with the research did not complete their project and Gave up (107 of them) amid various reasons such as *limited time*, *college or course*, *graduation*, *abandonment of colleagues*, *few resources or investments* and *entry into employment*.

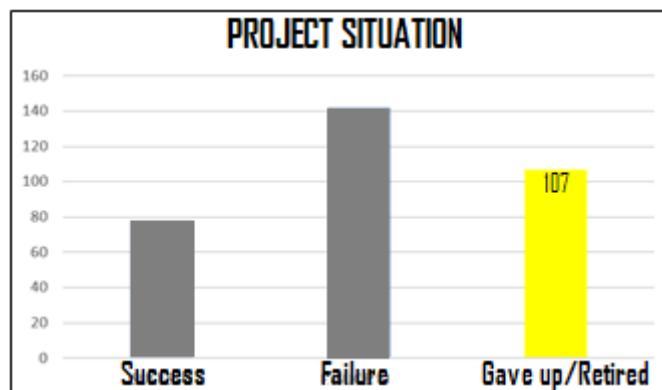


Fig.11: Situation of Projects - They Gave up.

Source: Prepared by the Authors

V. CONCLUSIONS

As mentioned earlier, the idea of this research was to study and map even partially the ecosystem of innovation and entrepreneurship among students of FATEC Guaratinguetá and other FATECs and ETECs located in the Vale region and, with this, check some programs, promote partnerships, list initiatives or research on the subject that occurred in the units and *generate feedback for those involved*.

At first and mainly, it was possible to establish a focus on active and closed *projects*, which was possible with the survey, which until the date of submission of this article, allowed contact with almost 400 companies. With it is perceived the formation, growth, and development of small companies from projects of the institutions of the CPS, being a fact highly praised, the incentive proposed by INTECFATEC and other laboratories and incubators crowded in FATECs and ETECs.

Research shows the success and survival numbers of small businesses, as there are many worrying cases of failure and dropout. It is also important to mention that many of these projects are idealized, but "still" no investments have been inserted in research, development or any other order or nature for the maturation of them. At this point, this article will be used as an alert and communication tool between projects that can be collaborative (using open innovation, for example).

With the results, figures are released for new products or services launched and derived from the projects INTECFATEC, INOVA, or simply from disciplines of FATECs and ETECs, and this is a very important data, due to the insertion of professionals and companies in the market, which slows the unemployment situation in the region and consolidates the quality of work offered by the cps poles.

This research document in its final version (the research is still in final stages) in the future will allow, then, more internal and external dissemination, will be contemplated with more knowledge and support, generate more data on the ecosystem of innovation and local and regional entrepreneurship, raising even more situations in relation to the projects initiated by the CPS programs, satisfaction of students and community members in response to the conviviality and learning they had and took with them. Those involved will again be interviewed and invited again to return with new projects and until they become students again.

Finally, the authors congratulate the drafting, creation, and investment teams. We are on the right track.

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